What Is Claimed Is:

1. A method for maximizing satellite constellation coverage at predetermined local times for a set of predetermined geographic locations, the method comprising:

determining a satellite constellation having a first coverage, the constellation including at least one desired satellite wherein each of the at least one desired satellites have a trajectory associated therewith;

determining a period of rotation for each of the desired satellites;

determining a time dependent coverage of the satellite constellation based on the period of rotation and the trajectory of each of the desired satellites;

tilting the trajectory of at least one of the desired satellites to obtain a second coverage based on the time dependent coverage, the second coverage providing maximum coverage at the predetermined local times for the set of predetermined geographic locations; and

generating command signals for modifying the trajectory of the at least one desired satellite.

2. The method as recited in claim 1 wherein generating the command signals includes programming a computer with orbital parameters based on the tilted trajectory.

3. The method as recited in claim 2 further comprising launching the at least one desired satellite with the orbital parameters programmed therein.

4. The method as recited in claim 1 wherein generating the command signals includes transmitting the command signals to the at least one desired satellite.

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5. The method as recited in claim 1 wherein determining the period of rotation includes determining if the trajectory of the at least one desired satellite is equatorial.

6. The method as recited in claim 5 wherein determining the period includes determining the period of rotation according to the following if the trajectory is equatorial:

$$P = [\ m_s D_s D_N / (nD_N + m_s D_s)\ ],$$

where,

P is the orbit period with its sign indicating whether it is a direct or retrograde orbit;

n is an integer with its absolute value equal to the number of times that the satellite transverses the same geographic longitude within the repeating period;

m_s is the number of mean solar day per repeating period and must be a positive integer relatively prime to n;

D_s is the mean solar day, which is 24 hours or 1440 minutes; and

D_N is the nodal day which is the period of the earth-rotation relative to the ascending node or any point of the orbit plane.

7. The method as recited in claim 5 wherein determining the period includes determining the period of rotation according to the following if the trajectory is not equatorial:

$$P = \frac{T}{n+m_N}$$

where,

m_N is the number of nodal day per repeating period which must be a positive integer relatively prime to n; and

T is the repeating period that the coverage pattern starts to repeat itself.

8. The method as recited in claim 1 wherein determining the time dependent coverage includes performing a simulation.

9. The method as recited in claim 1 wherein the trajectory is defined by a first coordinate system and wherein tilting the trajectory comprises:

translating the first coordinate system into rotation matrices;

transforming the rotation matrices based on the tilting; and

determining a second coordinate system based on the transformed rotation matrices.

10. A system for maximizing satellite constellation coverage at predetermined local times for a set of predetermined geographic locations, the satellite constellation having a first coverage and including at least one desired satellite wherein each of the at least one desired satellites have a trajectory associated therewith, the system comprising:

a processor operative to determine a period of rotation for each of the desired satellites, determine a time dependent coverage of the satellite constellation based on the period of rotation and the trajectory of

each of the desired satellites, and to tilt the trajectory of at least one of the desired satellites to obtain a second coverage based on the time dependent coverage, the second coverage providing maximum coverage at the predetermined local times for the set of predetermined geographic locations; and

means for generating command signals for modifying the trajectory of the at least one desired satellite.

11. The system as recited in claim 10 wherein the means for generating is a computer programmed to launch the at least one desired satellite into space with the modified trajectory.

12. The system as recited in claim 11 wherein the trajectory is a theoretical trajectory.

13. The system as recited in claim 10 wherein the means for generating is a satellite ground station operative to transmit and receive signals to and from the at least one desired satellite.

14. The system as recited in claim 13 wherein the trajectory is an actual trajectory.

15. The system as recited in claim 10 wherein the processor, in determining the period of rotation, is further provided for determining if the trajectory of the at least one desired satellite is equatorial.

16. The system as recited in claim 15 wherein the processor, in determining the period, is further operative to determine the period of rotation according to the following if the trajectory is equatorial:

$$P = [\ m_s D_s D_N \ / \ (nD_N + m_s D_s)\ ],$$

where,

P is the orbit period with its sign indicating whether it is a direct or retrograde orbit;

n is an integer with its absolute value equal to the number of times that the satellite transverses the same geographic longitude within the repeating period;

m_s is the number of mean solar day per repeating period and must be a positive integer relatively prime to n;

D_s is the mean solar day, which is 24 hours or 1440 minutes; and

D_N is the nodal day which is the period of the earth-rotation relative to the ascending node or any point of the orbit plane.

17. The system as recited in claim 15 wherein the processor, in determining the period, is further operative to determine the period of rotation according to the following if the trajectory is not equatorial:

$$P = \frac{T}{n+m_N}$$

where,

m_N is the number of nodal day per repeating period which must be a positive integer relatively prime to n; and

T is the repeating period that the coverage pattern starts to repeat itself.

18. The system as recited in claim 10 wherein the processor, in determining the time dependent coverage, is further operative to perform a simulation.

19. The system as recited in claim 10 wherein the trajectory is defined by a first coordinate system and wherein the processor, in tilting the trajectory, is further operative to translate the first coordinate system into rotation matrices, transform the rotation matrices based on the tilting, and determine a second coordinate system based on the transformed rotation matrices.

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